

REMARKS

Claims 1-27 and 32-38 are presently pending in the application. Claims 6, 11 and 32 have been amended for purposes of clarification and not for purposes of overcoming the prior art.

In the Office Action dated July 30, 2007, claims 1-27 and 32-38 were rejected. More specifically, the status of the application in light of this Office Action is as follows:

- (A) Claims 1, 6-11, 16, 19, 23, and 32 stand rejected under nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 4, 7, 10, 11, 12, and 13 of U.S. Patent No. 7,026,927 (the '927 patent).
- (B) Claims 1-15 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,729,336, issued to Da Silva et al. (Da Silva).
- (C) Claims 1-27 and 32-38 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent Application Publication No. US 2002/0193685 (Mate).

A. Response to Double Patenting Rejections

Claims 1, 6-11, 16, 19, 23, and 32 stand rejected under nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 4, 7, 10, 11, 12, and 13 of U.S. Patent No. 7,026,927 (the '927 patent). Applicants submit herewith a terminal disclaimer which renders the rejection based on a nonstatutory double patenting ground moot. Accordingly, applicants respectfully request this rejection be withdrawn.

B. Response to Claim Rejections Under Section 102(b)

Claims 1-15 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Da Silva. Claims 1-27 and 32-38 stand rejected under 35 U.S.C. § 102(b) as being anticipated

by Mate. Applicants respectfully submit that each of the pending claims includes specific features that are neither disclosed nor suggested by Da Silva or the Mate references. For example, these claims include features relating to locating a marker associated with a patient by analyzing a resonance set of inputs to determine the location of the marker. These claims further include a receiver that includes a ring time control processor that allows the adjustment of the interval of an observation interval. As discussed in greater detail below, neither Silva nor Mate disclose or suggest, among other things, these features of the claims. Accordingly, these references cannot support Section 102 rejections of the pending claims for at least this reason, and the rejections should be withdrawn.

1. Claims 1-27 and 32-38 Are Allowable Over Da Silva or Mate Because These References Do Not Disclose All of the Claim Features

Claims 1-15 are patentable over Da Silva under Section 102(b) because this reference fails to disclose several claimed features. For example, independent claim 1 and dependent claims thereof claim a method of locating a marker. Independent claims 6, 11 and 32 and the dependent claims thereof claim a method and apparatuses for determining a marker resonant frequency of a marker that utilize a resonant frequency and ring time control processor. As will be discussed subsequently, Da Silva does not disclose any of these claim features, and thus does not anticipate claims 1-15.

Claims 1-27 and 32-38 are patentable over Mate under Section 102(b) because this reference fails to disclose several claimed features. For example, independent claim 1 and dependent claims thereof claim a method of locating a marker that includes, *inter alia*, identifying a marker resonant frequency and adjusting an excitation source to the identified marker resonant frequency. Independent claim 16 and dependent claims thereof recite a system for locating a marker that includes, *inter alia*, a receiver that includes a ring time control processor that allows the adjustment of the interval of an observation interval.

Independent claims 19 and 23 and dependent claims thereof recite a system and method for locating a marker that includes, *inter alia*, a receiver that window filters a plurality of inputs. Independent claims 6, 11, 32, 35, and 37 and dependent claims thereof recite methods and apparatuses for determining a marker resonant frequency of a marker. As will be discussed in greater detail below, Mate does not disclose the claimed features, and thus does not anticipate claims 1-27 and 32-38.

2. Independent Claim 1 Is Directed to a Method of Locating a Marker that Includes, *Inter Alia*, Identifying a Marker Resonant Frequency and Adjusting an Excitation Source

Independent claim 1 recites a method of locating a marker that includes, *inter alia*, identifying a marker resonant frequency based upon multiple sets of plurality of inputs and adjusting an excitation source to provide further excitation at the marker resonant frequency. As disclosed in the specification, manufacturing variances interfere with providing markers having an accurately predictable resonant frequency (Specification, page 15). As claimed, the tunable receiver identifies the resonant frequency of the marker and provides that information to the excitation source. The excitation source can then provide an exciting pulse at a frequency that is closely matched to the resonant frequency of the marker. In this manner, better performance can be obtained by the system. Several methods for identifying a marker resonant frequency are disclosed in the specification, including for example, an iterative manner, by choosing a ΔF frequency spacing as a fixed percentage of bandwidth, interpolating a resultant response, and by using a sparse set of excitation frequencies to search a frequency range. (Specification, page 15-17)

3. Independent Claims 6 and 11 Are Directed to a Method and Apparatus for Determining a Marker Resonant Frequency that Utilize a Resonant Frequency and Ring Time Control Processor

Independent claim 6 and dependent claims thereof recite a method of determining a marker resonant frequency associated with a patient, including applying an excitation at one frequency, receiving a set of plurality of inputs indicative of a sensed magnetic flux, iterating through a set of frequencies, and identifying the marker resonant frequency based upon the multiple sets of plurality inputs. The identifying of the marker resonant frequency includes using a frequency and ring time control processor. Independent claim 11 and dependent claims thereof recite an apparatus for determining a marker resonant frequency of a marker associated with a patient including applying an excitation to the marker, receiving a plurality of inputs indicative of a sensed magnetic flux, iterating through a set of frequencies and a means for identifying the marker resonant frequency based on multiple sets of plurality of inputs. The means for identifying the marker further include a resonant frequency and ring time control processor.

4. Independent Claim 16 Is Directed to a System for Locating a Marker that Includes, *Inter Alia*, a Receiver that Includes a Ring Time Control Processor

Claim 16 recites a system for locating a marker associated with a patient that includes, *inter alia*, a receiver for analyzing a plurality of inputs to remove noise from the plurality of inputs, wherein the receiver includes a ring time control processor that allows the adjustment of the interval of an observation interval. Various marker designs may have varying ring times. (Specification, page 17) For example, some markers made from certain materials may have ring times that extinguish quite rapidly compared to other markers made of differing material. Due to the varying ring times, it may be advantageous to adjust the excitation pulse interval and the observation interval. Thus, as disclosed and claimed, the receiver has control circuitry that can control the operation of the excitation source in the time domain and a resonant frequency and ring time control processor to provide such modification of the length of the observation interval.

5. Independent Claims 19 and 23 Are Directed to a System and Method for Locating a Marker that Include, *Inter Alia*, a Receiver that Window Filters a Plurality of Inputs

Claim 19 recites a system for locating a marker associated with a subject that includes, *inter alia*, a receiver that window filters a plurality of inputs. Claim 23 recites a method for locating a marker that comprises, *inter alia*, providing a receiver that window filters a plurality of inputs. Applying a window filter, for example, includes signal processing that uses a weighting of the data obtained during the observation interval. (Specification, page 18) In one embodiment, the window can be a Blackman window, which improves the frequency selectivity of the receiver. In another embodiment, the window is a "matched filter" that has a window that emulates the decay signature of the marker resonance. The effect of the matched filter windowing is to improve the sensitivity of the receiver.

6. Da Silva Is Directed to Devices and Methods to Evaluate In-Stent Restenosis

Da Silva discloses a device and method "to evaluate in-stent restenosis," (Col. 2, Pg. 63-64), a condition wherein after a stent is inserted into an artery after PTCA, "the hyperproliferation of normal cells results in the obstruction of the flow of blood through the stented vessel." (Col. 2, Pg. 3-12) As described by Da Silva, "[s]tent structures have characteristic resonant behavior in their interaction with electromagnetic and or acoustic energy. These resonance features are influenced by the dimensions, structure, materials of the stent, as well as other features of the stent itself, and the surrounding materials and structures. Thus electromagnetic and or acoustic energy may be utilized to determine the physical properties of the stent itself, and the material surrounding and enclosed by the stent." (Col. 3, Pg. 8-16) Da Silva does not teach or disclose localization of the stent.

7. Claims 1-5 Are Allowable Over Da Silva Because This Reference Does Not Disclose a Method of Locating a Marker

Claims 1-5 are patentable over Da Silva under Section 102(b) because this reference fails to disclose, teach or suggest a method for locating a marker. As described previously, independent claim 1 recites a method of locating a marker that includes, *inter alia*, analyzing a resonance set of plurality of inputs, indicative of a sensed magnetic flux induced by a marker, to determine the location of a marker. Da Silva does not disclose, teach, or suggest analyzing a resonance set of plurality of inputs, indicative of a sensed magnetic flux induced by a marker, to determine the location of a marker or stent. Instead, Da Silva discloses a method to measure the response of the stent to determine whether restenosis has occurred. Thus claim 1 and its dependent claims 2-5 are not anticipated by Da Silva. For at least the foregoing reasons, the rejection of these claims should be withdrawn.

8. Claims 6-15 Are Allowable Over Da Silva Because This Reference Does Not Disclose Determining a Marker Resonant Frequency by Utilizing a Resonant Frequency and Ring Time Control Processor

Claims 6-15 are patentable over Da Silva under Section 102(b) because this reference fails to teach or disclose a method for determining the resonant frequency of a marker by utilizing a resonant frequency and ring time control processor. As described previously, independent claim 6, as amended, recites a method of determining a marker resonant frequency of a marker which includes, *inter alia*, identifying a marker resonant frequency based upon the multiple sets of plurality of inputs, wherein a resonant frequency and ring time control processor is used to identify the marker resonant frequency based upon the multiple sets of plurality of inputs. Independent claim 11, as amended, recites an apparatus for determining a marker resonant frequency of a marker that includes, *inter alia*, means for identifying a marker resonant frequency based upon the multiple sets of plurality of inputs, which further comprise a resonant frequency and ring time control processor. Although Da Silva discloses probing RF resonant modes, it does so only generally by stating that "the frequency of RF energy is scanned and the response of the

stent is detected in reflection, absorption, scatter, or other characteristic EM phenomena by detecting the modified RF energy." (Col. 3, Pg. 22-25) Da Silva does not disclose, teach, or suggest the use of a resonant frequency and ring time control processor to determine resonant frequencies of markers. Thus independent claims 6 and 11 and their dependent claims 7-10 and 11-15 are not anticipated by Da Silva. For at least the foregoing reasons, the rejection of these claims should be withdrawn.

9. Mate Is Directed to Systems and Methods for Target Location, Radiation Therapy, and Related Systems and Methods

Mate discloses, *inter alia*, various target locating, tracking, and monitoring systems usable with a radiation therapy delivery source, a radiation therapy delivery system, a radiation treatment system, a radiation target alignment system, an adjustable patient support assembly for use with a radiation delivery system, a method of identifying and tracking a selected target in a body for application of radiation to the target, a method of delivering radiation therapy on a selected target within a body, a radiation treatment planning method, and a method of positioning a body relative to a radiation delivery device for delivery of radiation to a target within the body.

10. Claims 1-5, 16-18, 19-22, and 23-27 Are Allowable Over Mate Because This Reference Does Not Disclose Identifying the Marker Resonant Frequency, Adjusting an Excitation Source to a Marker's Resonant Frequency, a Receiver that Includes a Ring Time Control Processor, or Window Filtering Inputs

Claims 1-5, 16-18, 19-22, and 23-27 are patentable over Mate under Section 102(b) because this reference fails to disclose several claimed features. As described previously, independent claims 1, 16, 19, and 23 recite systems and methods for locating a marker associated with a patient or subject. Independent claim 1 comprises identifying the marker resonant frequency based upon multiple sets of plurality of inputs and adjusting an excitation source to provide further excitation at the marker's resonant frequency.

Independent claim 16 includes the claim feature of a receiver that includes a ring time control processor that allows the adjustment of the interval of an observation interval. Independent claims 19 and 23 each include the claim feature of a receiver that window filters a plurality of inputs. While Mate does disclose methods and systems for locating a marker, Mate fails to teach or disclose these claim features. Thus, for at least the foregoing reasons, Mate does not anticipate claims 1-5, 16-18, 19-22, and 23-27, and the Section 102(b) rejection of these claims should be withdrawn.

11. Claims 6-10, 11-15, 32-34, 35-36, and 37-38 are Allowable Over Mate Because This Reference Does Not Disclose Methods or Apparatuses for Determining a Marker Resonant Frequency

Claims 6-10, 11-15, 32-34, 35-36, and 37-38 are patentable over Mate under Section 102(b) because this reference fails to disclose identifying a marker resonant frequency based on the multiple sets of plurality of inputs using a resonant frequency and a ring time control processor. Independent claims 6, 11, 32, 35, and 37 recite methods and apparatuses for identifying a marker resonant frequency of a marker. Mate does not describe or disclose methods and apparatuses for determining a marker resonant frequency of a marker based on the multiple sets of plurality of inputs using a resonant frequency and a ring time control processor. Instead, Mate describes that "[w]hen the markers are excited, they each resonate at a selected unique frequency." (¶ 00036) Thus, for at least the foregoing reasons, Mate does not anticipate claims 6-10, 11-15, 32-34, 35-36, and 37-38, and the Section 102(b) rejection of these claims should be withdrawn.

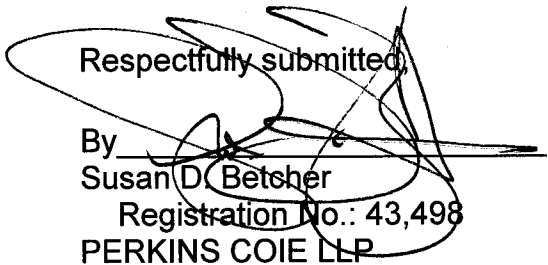
B. Conclusion

In view of the foregoing, the pending claims, comply with 35 U.S.C. § 112 and are patentable over the prior art. Applicant respectfully requests reconsideration of the application and a mailing of a Notice of Allowance. If the Examiner has any questions or believes a telephone conference would expedite prosecution of this application, the

Examiner is encouraged to call the undersigned at (206) 359-6088. The Commissioner is authorized to change any additional fees due by way of this Amendment, or credit any overpayment, to our Deposit Account No. 50-0665, under Order No. 341148021US from which the undersigned is authorized to draw.

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Respectfully submitted,

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